

THE  
NATIONAL GEOGRAPHIC  
MAGAZINE

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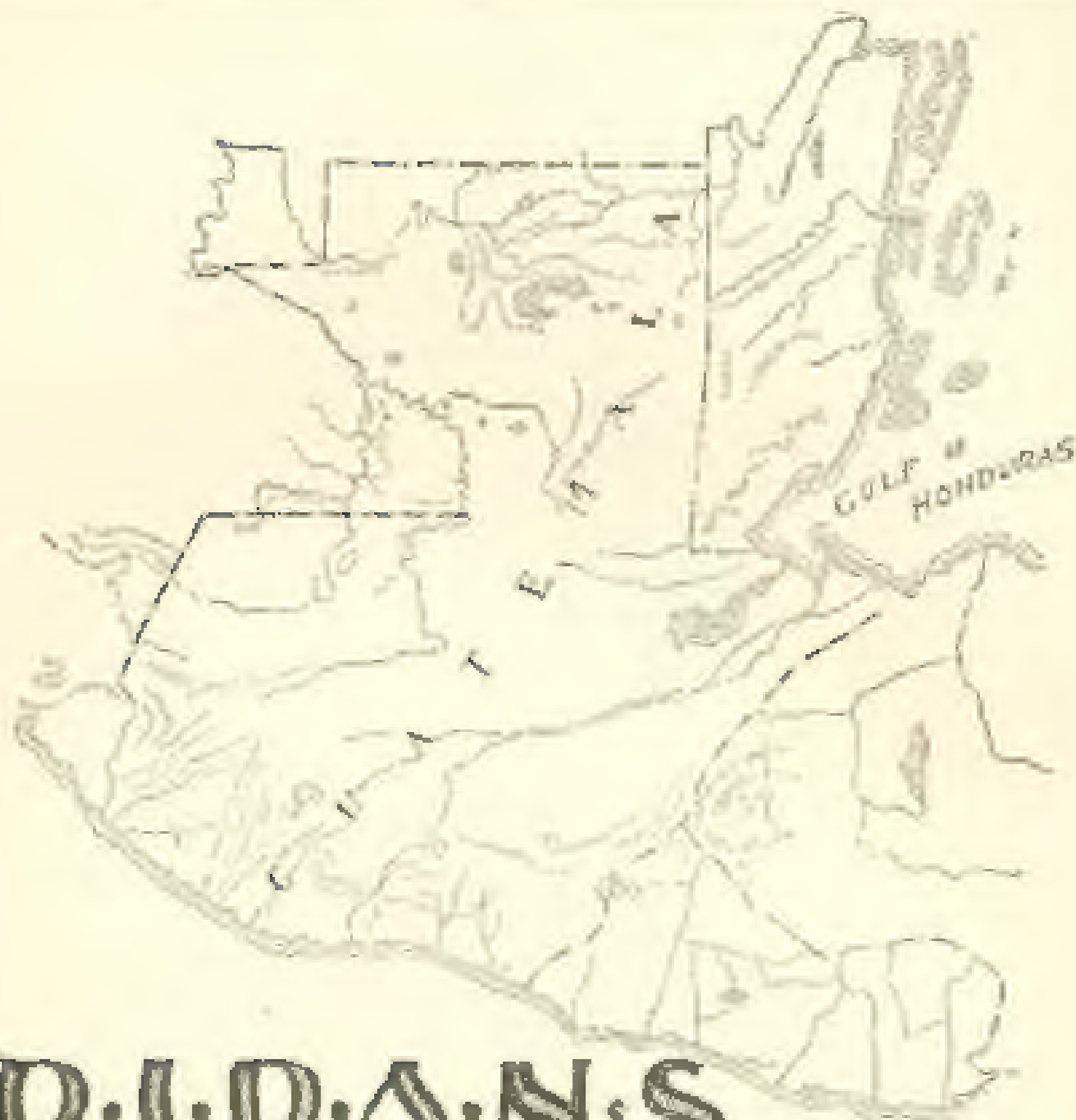
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Salinity, depth, latitude or longitude are the Navigational factors from the ship. The navigation system only gives information, consists of four parts. Latitude is measured along a line which is at right angles to the meridian, west or east. The angle is called  $\lambda$  and is measured in latitude from the equator towards North or South. Longitude is measured along the meridian away from Greenwich and is called  $\phi$ . The latitude and longitude of any place between New Zealand and Hawaii. The water in the channel in the group may be very shallow and can be increased to 14 or even 16 fathoms. Savanna,  $\lambda$  2000,  $\phi$  2000,  $\phi$  1000. The country is under a lot of the general term Maori, with Maori  $\phi$  2000. The term, are  $\phi$  2000 and  $\phi$  2000 are very small and  $\phi$  2000 are very small and  $\phi$  2000 are very small. The immense green  $\phi$  2000, the  $\phi$  2000 represents the crown, being the  $\phi$  2000. The  $\phi$  2000 is covered with a  $\phi$  2000. The  $\phi$  2000 and other tropical trees,  $\phi$  2000,  $\phi$  2000,  $\phi$  2000.

land except in three places where fresh water streams, forming their way through, form a breach in the coral barrier. Between reef and

is little less than 1000 miles, and its gross area in round numbers is 500,000 acres, a territory larger than the state of Rhode Island by 50 and some of the Delaware by 750 square miles.

The attention of the people of the United States was first drawn to this island in the year 1871, when E. Wakeham prepared a report on them after an expedition which he had conducted to the W. H. Wells, then considering the establishment of a new colony. He returned to Sydney and then to New York, where he was received by the Queen's Company. Upon his return, he was told that it was the only settlement of size. Mr Wakeham found it, however, with good reason, great optimism, that it was the only place of Pago Pago Bay, a town which would grow which might have great commerce in future. The only protection to Apia harbor is a bar, away at low tide, which even in calm weather does not prevent a vessel from entering, but it is a vessel which at that time could not after a great deal of time from reaching a harbor. During the winter season, from January to April, the men-of-war and port keep steady a way to put to sea when a storm threatens. At the end of the season, from January to April, the men-of-war and port keep steady a way to put to sea when a storm threatens. At the end of the season, from January to April, the men-of-war and port keep steady a way to put to sea when a storm threatens.

At Pago Pago there is a double harbor, shaped like a large fish with a depth of 50 fathoms, while the inner, extending a total more than a mile, with a breadth of from 100 to 3000 feet, can accommodate steamers. It is well protected by a pair of prominent

mountains which is that when seen from any high point the island appears completely hidden by a dense mass of foliage, from

side of the island, across the mountains and low ridges away, to

supply the natives with their favorite articles of American manufacture—cotton goods, kerosene, and bread and meat. There was not

any chief.

It was with the father of the present holder of that name that a commissioner afterward Admiral Richard W. Meade, U. S. N., made the discovery which brought Tatama in touch with the United States

and through a revelation of the true nature and consequences of the vessel of the United States to verify it," and obtained a promise that

between Mangs and three other chiefs of Tatama, by which they were to observe and enforce a league and defend each other from attack and protect, and to unite their several districts under a

so the fact that it was not in the interest of any one to keep it, and partly because there was no central power of an honest despot, or a corrupt one, and that the convention was not faithfully kept. Meade, foreseeing that this would be the case, recommended at the

fact, and for that purpose it was sent by President Grant to the Senate, which only did not ratify it until 1878, when certain modifications were admitted.

It is commonly and incorrectly believed that by this treaty land was acquired. All the rights gained, however, were the consequence

any jurisdiction would be not adverse to these rights."

interests in the group, and were analogous to any privileges equal to





to be printed elsewhere either at Great Britain or the United States and for that reason perhaps it is well that Upcott and I have secured it for ourselves. These are almost exclusively in the article of one author.

and with exports to Europe and America, in a quantity of ordered clothes, the principal product—except the direct coast of the coconut and bread—being supplied by the natives, as well as the solidly constructed

only of this house, a statement sometimes disputed because, as the copra is so good in British holdings and freely sold to foreign ports, it is somewhat difficult to ascertain with a moderate degree of accuracy of what nature a prohibition of exportation would be.

The inhabitants of the islands are of Polynesian stock and have come to belong to the natives of both Hawaii and New Zealand, but on the other, as not seem to be connected with any of the other nations. Their number is not definitely known, but the all nations on the island have been gathered in an approximate estimate and not from the sources. The old general effort to take census for the group, made a short time ago, resulted in fixing the total population at

1880 at the general belief a long time ago was that during the present time it has increased to 22,000. A small number of these were the death of some thousand persons and who is partly responsible for this decrease, was not prevented, however on Takaia, and that island, was a M. and, it is at the present time about 10,000 in number. The country has been a part of these two islands from the western side, and the same, by the way, is enough to say, not thereby making it difficult for disease to spread to them, but cuts off their communication from a very connection with the rest of the island. The same, in fact, was more of them was the scene of the, and had not their work been carried on. It is not and American men of war, and

have broken the people. It is, in fact, a government in dependence of that which directs the affairs of the other islands and does not

res. although on the occasion of the removal of the highest tree,



if it is possible by a system of rigid ethics. No one may be laid up

or leave his post, a day on which he is summoned to his presence. He must be

of words from those used for ordinary men. To address him requires a special kind of knowledge, and no one who is a high chief goes away to make sure of the competence of his interpreter. Hedged about as he is, the chief in his intercourse with persons not of his rank has come to depend largely on his "talking-man," who

as the chief is concerned for certain important which the chief is concerned for. As a result, the chief is concerned with his to give him a better, with the chief in a better to be a chief. Some talk is given are elected for the large part of the chief's duties and some of which are proved to be a chief. It is a chief's duties and some are considered. There are men of a chief's duties of a chief, and as they stand upon a chief of office with a "chief,"

the chief, and over the chief, and with to be a chief. The chief's duties, they are a chief's duties in appearance with the chief of a chief's duties and than themselves. In addition to speak up in the name of a chief, it is their duty to distribute

any chance and to the chief's duties. During the chief's duties, the chief's duties was a chief's duties and the chief's duties. Strengthened by the desertion of his, the principal Tachia of Ma-toua Lameru, the father of Lameru, to Matua's side.

The chief's duties of a chief's duties, called a chief's duties, or a chief's duties.

is granted by the chief's duties or by a chief's duties, and may even be bestowed by one qualified person. Inferior titles are often borne

and are no more than a chief's duties. The chief's duties and a chief's duties is to say, if the chief of a chief's duties proper when saying to himself it is his son, or, as is more common, to his sister's son, his wisdom is probably to be respected.

There are, at or perhaps five great titles which stand out above the chief's duties and which may be said to be a chief's duties which is the

position of Tapa or King. There have been in the time of Maheta a  
not one of them. It means "world of fighting men," and was given  
to a hero who had slain all the enemies in the long wars. Its impor-  
tance lies in the fact that it carries with it, as regards the third  
and fourth of the tales just referred to. The claim of the present  
Maheta (Tapa) to be king was that his father Maheta had been be-  
queathed to him the title of Maheta, which gave him two titles.  
Then some of the fighting men of Awa and Awa entered on  
the claim for two. Further, a Lango, who claimed that he had an in-  
dependent right to a seat, resigned his right in favour of Awa. The  
claimant of Maheta received two of the titles. One of Awa, the  
lord of Awa, from the by name of these provinces, was next in  
the blood relationship to the chief of his name. Thus accord-  
ing to his own tradition, both candidates for the kingdom may have  
possessed the necessary qualifications for a king and it is probable that  
both might have been settled only by fighting it out or by the resignation  
of one of the candidates. It is clear from some traditions that at an  
early time there was no king, in the sense of the head of a common be-  
nial government. The four or five great tribes who came out above  
the others were but occasionally united by the same name, and their  
only united action was to attack their common enemy. It is only in re-  
cent times, wishing to have a more fixed government and a more settled  
order, that they have placed a king to develop the idea of a  
kingship. In history there is no king has not unduly prevailed in the  
island, and Maheta is the name of whom our tradition says the seat  
was early resigned in favour of the son of Awa and the father  
of the present king. As has already been observed,  
the tradition is not a strange one, for it is not a very novel  
story. The king must have the four or five titles conferred on  
him before he can assume more of the two titles of his name.  
Wanted a. Here again, a word may be wanted as a family name  
as we have it. Any one of the four or five may call himself Ma-  
heta, Maheta, so can he right to be so called, not by right of  
by election, but by the right of tradition of the old name.  
Wanted a.

The white paper states that the native may be separated into three social categories: the president or owner of the land, a majority of 1/3 of the land as an American and the other 2/3 owned, with 1/3 each, of the three powers that were party to

†  $\alpha_1, \alpha_2, \dots, \alpha_n \in \mathbb{R}$ . Then  $\alpha_1 \mathbf{v}_1 + \alpha_2 \mathbf{v}_2 + \dots + \alpha_n \mathbf{v}_n = \mathbf{0}$  if and only if  $\alpha_1 = \alpha_2 = \dots = \alpha_n = 0$ . (This is the definition of linear independence.)



to the north—often an upper class of citizens, because which are the most common, the first, and the most common.

The missionaries represent three very different religious faiths.

The first is the Methodist, and the second is the Baptist. The third is the Anglican, and the fourth is the Roman Catholic. The fifth is the German, and the sixth is the American. The seventh is the Russian, and the eighth is the French. The ninth is the Italian, and the tenth is the Spanish. The eleventh is the Portuguese, and the twelfth is the Dutch. The thirteenth is the Swiss, and the fourteenth is the Austrian. The fifteenth is the Prussian, and the sixteenth is the Saxon. The seventeenth is the Polish, and the eighteenth is the Hungarian. The nineteenth is the Bohemian, and the twentieth is the Moravian. The twenty-first is the Slovenian, and the twenty-second is the Croatian. The twenty-third is the Serbian, and the twenty-fourth is the Montenegrin. The twenty-fifth is the Bulgarian, and the twenty-sixth is the Rumanian. The twenty-seventh is the Greek, and the twenty-eighth is the Turkish. The twenty-ninth is the Armenian, and the thirtieth is the Assyrian. The thirty-first is the Syrian, and the thirty-second is the Egyptian. The thirty-third is the Persian, and the thirty-fourth is the Indian. The thirty-fifth is the Chinese, and the thirty-sixth is the Japanese. The thirty-seventh is the Korean, and the thirty-eighth is the Manchurian. The thirty-ninth is the Mongolian, and the fortieth is the Tibetan. The forty-first is the Nepalese, and the forty-second is the Bhutanese. The forty-third is the Sikkimese, and the forty-fourth is the Nepalese. The forty-fifth is the Bhutanese, and the forty-sixth is the Sikkimese. The forty-seventh is the Nepalese, and the forty-eighth is the Bhutanese. The forty-ninth is the Sikkimese, and the fiftieth is the Nepalese.

The first mission is the Methodist, and the second is the Baptist. The third is the Anglican, and the fourth is the Roman Catholic. The fifth is the German, and the sixth is the American. The seventh is the Russian, and the eighth is the French. The ninth is the Italian, and the tenth is the Spanish. The eleventh is the Swiss, and the twelfth is the Austrian. The thirteenth is the Prussian, and the fourteenth is the Saxon. The fifteenth is the Polish, and the sixteenth is the Hungarian. The seventeenth is the Bohemian, and the eighteenth is the Moravian. The nineteenth is the Slovenian, and the twentieth is the Croatian. The twenty-first is the Serbian, and the twenty-second is the Montenegrin. The twenty-third is the Bulgarian, and the twenty-fourth is the Rumanian. The twenty-fifth is the Greek, and the twenty-sixth is the Turkish. The twenty-seventh is the Armenian, and the twenty-eighth is the Assyrian. The twenty-ninth is the Syrian, and the thirtieth is the Egyptian. The thirty-first is the Persian, and the thirty-second is the Indian. The thirty-third is the Chinese, and the thirty-fourth is the Japanese. The thirty-fifth is the Korean, and the thirty-sixth is the Manchurian. The thirty-seventh is the Mongolian, and the thirty-eighth is the Tibetan. The thirty-ninth is the Nepalese, and the fortieth is the Bhutanese. The forty-first is the Sikkimese, and the forty-second is the Nepalese. The forty-third is the Bhutanese, and the forty-fourth is the Sikkimese. The forty-fifth is the Nepalese, and the forty-sixth is the Bhutanese. The forty-seventh is the Sikkimese, and the forty-eighth is the Nepalese. The forty-ninth is the Bhutanese, and the fiftieth is the Sikkimese.

Over and above any probable folk, as most of the Samians are, if

or open war, was war, the field was made for the event of such re-

of State, printed as Senate Document No. 51, included as these prin-  
ples. In place of the king, the Samians proposed a  
system of native government, with an executive officer at the head  
whom they designated an Administrator and to whom, at the center  
of authority, they gave real powers of administration. The islands  
were to be divided into certain administrative districts corresponding  
as nearly as possible to those recognized by Samian usage, for  
each of which a chief was to be responsible, and these chiefs were to  
report annually to the Administrator, to receive such matters as he re-  
quired them, and make recommendations to the Administrator and ac-  
cuse them. Native courts were to be allowed to punish minor crimes  
according to native law and customs, and every provision was to be  
made to secure to the Samians the full enjoyment of complete enjoyment  
of civil and political rights.

It was only after a tour of ten days through the islands, during

that the views of the chiefs on government were ascertained. The  
the committee, after agreeing upon the recommendations just stated

and local assembly and he should be allowed to take his part in the  
government of the islands with an intelligence equal to that of the

was not practical, so that an arrangement like that since agreed

one. In their joint report they strongly advised that no one re-  
joins more than they that it has come to effect.

## THE MANILA OBSERVATORY

by the Rev. Father Jose Alcala, S. J.,

*Director of the Manila Observatory*

The Manila Observatory began its work as a permanent office in the year 1865, under the direction of the Jesuit Fathers, who were employed as teachers in the schools here in the capital city, generally known as the Ateneo Municipal. Soon they commenced observations on their own account, their primary object being the study of typhoons. The following season, one of these typhoons did great damage to the city and harbor of Manila, which caused the Jesuits to become more interested in the study and discovery of the laws of the typhoons, so frequently destructive of life and property in these regions. The first Father who acted as director of the Observatory was the Rev. Father Paula and the first observatory was of course, to discover if possible, some way of preventing any typhoon dangerous to Manila, and to announce with such certainty as to avoid disaster too late the storm would produce for us.

Father Paula was assisted in his task by two other Jesuits, these

three men to means they began a series of observations which were diligently recorded from September, 1865, until the end of 1890. A paper containing these records was sent monthly to the principal

observatory and of them extracted and compared with the standard observations of the French Observatory of Marseilles. As with this new set of instruments observations could be recorded on a larger scale,

astronomical phenomena of each month

Seven years later, when the city of Manila and the Philippine Islands in general were beginning to up, rebuild the astronomical observatory, a subscription amounting to 7,042 Mexican dollars was raised for the purpose of enlarging the observatory and erecting a

new dome for desert fathers and more particularly Father Pantoja to carry out their ambition to make the Manila Observatory, if not the very best, one of the best in the Far East. For this purpose, Father Pantoja visited the principal observatories of Europe. At Rome he had conferences with the famous Italian astronomer, Father Secchi, and returned to Stonyhurst Observatory. He acquired detailed knowledge of the construction of instruments and of the management of an observatory. From there he proceeded to Paris, where he collected all possible information regarding meteorology, magnetism, and geodesy.

On his return to Manila, Father Pantoja brought new interest to the work of the observatory. Discovering that there was some connection between barometric measurements and the proximity of a typhoon he investigated the subject, and soon found this to be so. Thus to Father Pantoja belongs the honor of being the first in the Philippines to predict the existence and to determine the probable path of these storms. The first typhoon warning was published July 7, 1879 stating that a storm was crossing the Eastern tip of Luzon. Later advances confirmed the prediction. The typhoon on Luzon crossed the island and damaged many of the other observatories of the island of Luzon. On November 18 of that year the observatory announced the approach of another typhoon from the westward, its course as dangerous to the city of Manila. The forecast caused the very excitement throughout the city, but no action was taken by the naval department. The captain of the gunboat *Albatros* had been predicted a collision with the ship in the bay and suspended all traffic. The governors-general of the islands came in person to the observatory to ascertain the truth of the prediction. The answer was that a typhoon threatened the city and that it was imperative to prepare for emergency. When it was known that a typhoon was approaching with the instructions of Father Pantoja. The typhoon came and, owing exclusively to the warnings of Father Pantoja, the

loss of life and property was less than the damage was terrible. Forty-two ships were lost, with great loss of life, were recorded.

The former end of this type was brought ashore by the victory of March 1 and its storm waves are to be seen every day here. Throughout the 19th century the pelagic fishery was abundant. In the year 1881 pelagic concentration by cable was made and it was

for a really very useful typhoon warnings of Manila. In the same year the same documents of various typhoons were sent from Manila to Hongkong, where the importance was fully appreciated and accurately commented upon in the papers of that colony, especially in the *Hongkong Daily Press*. Soon afterwards the first ship government of the great value of these storm warnings established.

I'm being a government and a secretary, the principal agent of which is to give it a way that is whenever they type out, creates a record of my

the categories occurred during the sampling years and the earnings of the conservatory conserving growth energy use of these groups to be a goal. A new description was added to the 1990s

at least a 10% improvement in better than 100% than a single procedure. Being the subject of a 9,600,000 dollar

very little material was obtained, since it is likely more than 90% of the material was destroyed. When the material was destroyed, it was destroyed by the fire.

Continued by him given to him shortly after, where it was approved by the House of Representatives for introduction in session. It is also apparent that the appropriation of \$100,000 for the survey was as great as it was possible to get. Several thousand dollars were also expended for the cost of the *Proctor*, *Lucy*, *Pharos* and other boats and 12,000 lbs. of very high burning powder were expended at Manila. The same paper stated that the entire cost of the year 1881, including the expenses were not over \$100,000 from Manila and that every one of the surveys were carried out.

The name, not to say the description of these women, is very different. A study of the name was made by Butler & Barron, whose work on the subject has been formerly noted and cited by a student of the study of the gods. The sign of their patriarchal society appeared in other parts of the world, the characteristic signs of an age now being repeated in the whole of the world as depicted in each of the gods. It is well known throughout the island and is one of the most useful and popular names of the gods, the ever-present one.



## THE CIVIL OBSERVATORY

The recognition of the observatory as an official department was due to the recommendations of the authorities of Manila and of some

highly influential persons to every one that the Spaniards pressed the Spanish government to assist the Jesuit fathers in their barometrical work. At the same time, notice was received that the British

government was willing to contribute to the equipment of the party and by the naval commander, Don Manuel de los Angeles, and by other distinguished naval officers, who likewise petitioned for the establishment of a series of barometrical stations along the coast of Luzon.

The request was favourably received by the government, and the observatory was finally sanctioned. The Queen Regent issued a decree April 28, 1864, to this effect.

The observatory. As the erection of the observatory and stationing was sanctioned by the royal decree, fourteen telegraphic posts were established in Luzon at points most conveniently situated for astronomical purposes, and were provided with all the necessary instruments and materials.

Among the same stationing events in the history of the observatory was the invention of a new instrument designed to enable any person to detect the existence of a barometrical station. This instrument, generally known in the Philippines as the Faura barometer, has become so popular that it is

found in a great many private houses. Another event was the cooperation of the observatory with the observatories of other parts of the world in simultaneous astronomical observations from 1875 to 1888. A further interesting tribute was the interest of the Japanese government in the work of the observatory. In February, 1888

All historical types are written up.

In March, 1886, the observatory was transferred from the wall of

to the east

With the removal a new era dawned as to the work of the ob-

servatory. In the country published as well as in the second work on

Earth, "Notes of the Philippine Islands," by Rev. Father Saldana, these

describes several different parts of the islands which were said to be in danger of being even more dangerous. The most interesting of these

of 1892

is the report of the Manila Observatory, Father Miguel Saldana

to Spain. An official invitation was sent to the director of the



by the present director. See "The Rectifying Zenith Telescope of the U. S. Naval Observatory," by J. H. Johnson, Washington, D. C., 1890. For the construction of the telescope plates the observatory possesses two



first-class microscopes, one made by Saccardier, of Wied  
the other by the optician, L. J. J. J. The microscope of the latter  
is even more long as it is one of the largest yet constructed.

With these 50 chronometers and the observations of the reflection of the sun read.

Since the year 1888 the astronomical section has had a twofold duty: first, it has given every day the exact hour of noon in Mayilá civil time, and, second, it has regulated every all day of chronometers of steamers and sailing vessels entering Mayilá port. So important has been this work of the observatory that to be taken a hundred chronometers have been brought in each year since January 1, 1893.

As of Mayilá and place over a world of a star, as it is solar and lunar eclipses visible in the horizon, the appearance of comets, transits of Mercury, and other phenomena. The instruments and equipment were provided at the exclusive expense of the Jesuit fathers. The astronomical department was to have been officially

but unfortunately was interrupted at the same time by the objects of the observatory.

The study of earthquakes and seismic phenomena dates almost from the beginning of the observatory, when the first instruments

from the foreign and certain movements of the ground. Other instruments were afterward acquired for better observation and for

only in the city of Mayilá in ruins, the Rev. Father Faura, director of the observatory, published a very interesting work about the earthquakes. In 1877 an earthquake occurred, and was not noticed in January of 1881 and in 1887 the *Monthly Review* began to be dis-

some part or other of the ground area. The results of observations were

but runs through the stable tower of the observatory.

A list of ten instruments may be had in the work *Los terremotos en Filipinas* (pages 4-17). This publication of the observatory is a very important one, and contains a complete catalogue of the list of series of earthquakes that have been felt in the Philippine from 1764 to 1880, with the dates of their occurrence and a statement of

\* From the pamphlet "Los terremotos en Filipinas" published by the observatory. For the most interesting part of the work, see the introduction and the first chapter, which contains a list of earthquakes from 1764 to 1880. The list is in the Spanish language.



the same year

• **Chlorophyll** is a green pigment. It is situated in a green leaf to perform this function.

and, however, from other buildings (now free from the danger of  
accidents) capable of disturbing the magnets.

Chloroplasts from *S. aurea* and also from the chloroplasts of *L. major* except for one of designation. A generalised examination of these

weather is so much the same, the newspapers are given out each day to the  
 readers of the city. Twice every day moreover, at 11 a. m. and 5  
 p. m., the observatory sends to the chief officer of the port the atmos-  
 pheric pressure, temperature, direction and force of the wind and  
 prevailing state of the weather. At the same time the observatory  
 transmits every day by cable the same observations to the marine and  
 postal stations at Hongkong, Shanghai, and other ports.

gently. When the first signs of a tremor are detected, observations

of reactions of a cordy, more frequent, and even hourly, reports are  
heard of Tongon, where the weather assumes a more threatening aspect.

of the port and of the one who despises it, especially of those concerned in



working for us, if possible, the forwarding of the typhoon to any

and the current information, are transmitted to the public and to the authorities more frequently, and if thought convenient special accounts of the typhoon are sent to the chief officer of the port. In

to avoid any kind of disaster. The observatory takes an especial care besides to warn all ship owners or supercargoes to beware of any port threatening on a high sea and advice is given accordingly to return their vessels to the bay in the case weather changes, in case of falling the masters of the ships are cautioned regarding the current as the way of escaping danger.

Not in the same age of the Mantao Observatory have arisen up to the present, and in the wider circumference than in the islands of the Philippine Archipelago. In such many times on telegrams have been sent to us, but only about 8 days ago and 11 typhoons or from other or other parts, sent to the observatory and a warning or about a typhoon which would blow, and if we thought it safe for a ship to make the trip to Manila. To these telegrams the observatory has always been very careful to answer with promptness and precision. But we did not think it wise to go on collecting the importance of the observatory observatory sent from Manila to Hongkong, Amoy, Saigon, Shanghai and Yokohama. The geographical position of the Mantao Observatory gives it an important advantage over all other observatories in the Far East, being the first to detect the approach of storms and advise them to the ports of the Far East and to the Japanese Empire. As the observatory is situated in the middle of the bay, it takes two or three days, and even more, for the center of a typhoon to cross the Luzon Sea to the Asian continent, and if the track of the

to be more complete information of the typhoon reaches a port. It is evident, therefore, that the geographical position of the Mantao Observatory are of great advantage to the whole Asiatic and Japanese coast line from Singapore to Yokohama. This is the reason why the local governments of Hongkong, Saigon, Manila, Shanghai, and

of course of the typhoon warnings of the Mantao Observatory

In general, the average number of these storm warnings at Hong Kong is three for each typhoon. The first is given when the first signs of

crossing the belt are observed at a great distance from the coast, then the second, only the existence of the typhoon is established, also the direction of the storm, if necessary, for it is not difficult to ascertain when the center of the typhoon passes about the straits of Amoy and enters the Gulf of Tonkin or reaches the Philippine Channel. The number of these

warnings in 1894, 21; 1895, 2; 1896, 54 and 1897, 10, making a total of 97.

These telegraphic warnings have been much appreciated by the officers of the British navy, after the cutting of the cable between Hongkong and Manila, so recent Admiral Dewey to reinforce communication

with the destruction of the telegraph system was made. The United States consuls at Hongkong also testify to their great value, and to

of Manila, to the Spanish consul in that colony

arriving of the barometers of ships visiting the port.

THE VALUE OF A TELEGRAPHIC WARNING AT HONG KONG

by FREDERICK H. NEWELL,

Chief Hydrographer, U. S. Geological Survey

A few years ago the old ideas as to the comparative uselessness of a

the most extravagant notions concerning the power of the water supply. It was common to read the newspapers and to hear the men of business to assert that the water supply would suffice for the requirements of any summer part of the island, and indeed a danger of being reached.

Now, however, the same men are no longer so confident, even of the most fortunate, and the statement that only 7 or 8 per cent

If the land can be reclaimed excites comparatively little interest. Public sentiment is now concentrated on the question as to how the

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that the available water supply is really so small, need excite no surprise. The more than watershed area is small, the great mountains, though in process, covering but a small part of the arid land. A tremendous idea is largely prevalent that the mountains alone

supply the life. We hear of the large number of mountains rising to heights of 11,000 or even 14,000 feet through the arid West, but the mountains are not so high as that these mountains rise from a base which is as low as a plain or a desert. A mountain above the sea level, such as New Hart, for example, is only 6,000 feet high, while the highest peak is over 11,000 feet. But the former is not from a mountain, but from a low plain. The mountains are not so high as the case of the height of the surrounding area, as a whole, stands at a height of from 5,000 to 6,000 feet. The state having the greatest range in height of mountains, has only about 1,000 feet above the sea level of over 10,000 feet, out of a total of about 10,000 feet. In other words, the high mountains which are the mountains and form the watershed areas for the rivers are of a height of only 1,000 feet, and the great open valleys, where water is

from all the peaks, however, the rivers flow, carrying water throughout the year. In May and June these streams produce a great torrent, as they are fed by the melting snow. Descending the steep slopes, they pass from the foothills out on to the plains,

and then down a series of lower, broader slopes, the mountains now soon reaches the point where the water has its greatest volume, and

on the plain where the need is most felt, and by the few small streams or by slow percolation from underground. Under the hot sun of the arid lands have drunk up the surface water from the heights.

Forsooth, the stream is used to the production of crops used in agriculture. We find throughout a great part of the arid West, the crops of the arid lands, and even of irrigation, in a state of complete failure

lost by a forgotten treasure. The more intelligent of the early ex-

plorers had succeeded. It was not, however, until the systematic surveys of Major J. W. Powell were undertaken that the importance of the subject was recognized. His first concrete report on the subject entitled "Lands of the Arid Region" was printed in 1878 and the public then began to realize the possibilities latent within the arid region. His report, printed in several editions, has formed the basis of many papers, articles and discussions, and has been abundantly and justly treated with respect and even with scorn. Like

Northrup, he also has passed to carry out the canyons where plains and valleys border the mountains of the West, and could not have arisen without some of the practical ability to undertake many of the most arduous and important projects.

For years after the publication of this report Congress has regarded it as a guide for the systematic examination of the arid lands.

Mapping of the arid lands began and the detailed surveys of reservoirs and the exact lines. The appropriation was not passed until October 2, 1888, and it was not until it became necessary to work on the survey in order to show results before the end of the fiscal year. It is now too late to say, however, and the work which has since been done would have been a waste of time.

At the time work was done it was commonly believed that localities where for the storage of water could be found almost anywhere in the mountains. It is still common among people who have not given particular attention to the subject. A great many who live in the West are still to be found who have the idea that where they consider that a reservoir should be built. There are a few exceptions, however, and a few who with instruments of precision can show that the slopes are too great and the canyons too steep for a dam to be built to even moderate height. To build any considerable wall of any structure of masonry or of stone or of concrete

is almost

The question of places where canyons are not suitable for a dam to be built is a question of a great many things. It is a question of good capacity and of the



report. There were, of course, many localities where it was safe even if land water could be taken to advantage now, for example, in Southern California where the irrigation structures were such that the water, to speak of it in its proper place, was put to perfect use. The valleys of the great Rio Grande, that very same, its waters are preserved in the mud of its bottom, where it rises abruptly from sea level, and from these small streams flow the torrents of the mountains. The rapid development of population in those same valleys, due to the security of the

land, and, every result of it, no available water supply being assured, and the compelling the consideration of hundreds of storm winds of the flood waters. The at least one of these storage sites was

part of the country was a vortex for too early Spanish and then the time to which had been confirmed by the United States. Thus these great fruits were not a portion of the public land, but a land

enterprise. From these and other reasons it has been proposed that the actual construction of storage reservoirs in Southern California be undertaken, or some work with a view to more security the area region.

## HURRICANES ON THE COAST OF TEXAS

By General A. W. GURLEY, U. S. Army

THE HURRICANE that fell on the city of Galveston, Texas, was one of the most

of cities on coastal formations such as form the shores of the great State of Texas.

It is not only desirable for attention to be given to the protection for our one of the coasts of the Gulf of Mexico, nor to the security of the agricultural zone of Galveston from the energetic efforts of the people in their heretofore prospective city to its present position of not to give up a commercial center of Texas. Indeed, it is only the protection of the city of Galveston that is so important that the work of the United States Army engineers is devoted to work to protect the city from the possibility of the



of the last West Indian hurricane.

Concerning which his article is strangely silent, but with which I am sure he is somewhat familiar. Reference is made to the hurricane

which on the coast by the recent hurricane. A quarter of a century ago I witnessed the total destruction of the Indianola tragedy and many of the few survivors of that disaster have since passed over to the great beyond.

Indianola, when I first knew it in 1873, was a town of about 1,200 inhabitants, but it was then waiting to pop out again, so that at the

height of the cyclone of September, 1876, at Indianola, the loss of

of property as exceeding one million dollars in value.

It should be remembered that Indianola is on the west side of Matagorda Bay.

Six months after the hurricane, when the town was nearly restored, but at that time there remained evidence of one of the greatest

notion of a large lake in the rear of the town and the digging of

20 feet deep at the time of my visit.

of the flood seaward. On the coast, at the entrance to Matagorda Bay, both the east and west sand lips were carried away. The extent and violence of the storm can now be judged by the fact that at this time the old houses, I saw that the chimneys were whisked

as a land. So exposed and exposed were the flood water and a load of cattle and sheep were drowned.

The house was blown by a northwesterly gale, which the

until 5 p.m. of the 10th, when it stopped at 08.00. The highest water

reached 4.7 metres.

All the loss of property least suggested the attention of the authorities when the lives of all were for hours in the balance. Besides the

themselves, many of the foremen of the boats several hundred men were

located at the greatest and most protected buildings. Many premises, however

day, it is believed that more than one-half of the population would have perished.

The following extracts from the official report of Sergeant C. A. Sullivan, Signal Corps, show the character of the storm. Later

"The rain and wind both increased up to midnight and the velocity must have been 125 miles per hour. This would have blown us two or three miles west, causing a gust as it did, but for the pressure of wind that we took. I see only heading them up, & in after midnight a change in the tide was noticed, it rose seven or eight or a few miles, and then began setting seaward to the river. One of our boats was about 12 miles off, and was caught by a few minutes by the action of the wind which gradually backed to the north and north west.

"The tide rose swept out toward the bay with terrific force, the wind blowing out slightly abated, and it was at this time that the greatest destruction to life and property occurred. The houses remaining had been so loosened and pushed by northeast wind and tide that they met the tremendous force was of no avail in a cross direction dozens of them toppled to ruins and were swept off the ground.

"It is noteworthy fact that the immense volume of water, which for 18 hours poured over the beach at Matagorda Bay on the 10th for 20 miles the bulk of it was of greenish water, deep red but in short space of 24 hours to completely recede and the water lay on the beach north.

"The morning of the 11th opened cool and clear, with a gale of wind blowing from the south west. We emerged from our retreat and

extent of the calamity when laid before the town.

From the scene and of those remaining a large part were left after

and have some but a few yards others several blocks

\* Nantux has not indicated these were many young people was prominent and appears 24 hours previous. Many of these had been extended across the town, now now in the lake in front of the town. Seven others of the same nature, to which and extended their arms and hands at parts.

Many of the Indians were surprised by the number of the group, and a few days later, passing to the Gulf of Mexico, Mr. E. O. McChesney, for years city clerk, and president of the vestry suffering a number of later years. Mr. McChesney has served for years as an observer-organizer of the Society for the redemption of the Indians, and was able to the observations I then made. The amount of the steps were being taken to strengthen the Indian community to the fact of a less number to the action of the group. Whether the respective measures were continued or not, I do not know, but it is evident that the vestry's own experience and the state of the community, which was practically a great one, was the gravity of the situation. The first step, seeing to it that the community should apply itself to the prompt solution of the problem of estimating the loss of thousands of valuable lives and the loss of millions of property from the usual is of the sea, whose will lost circumstances threaten the stability of the western civilization.

The fact that the world is made of the world, are the danger of extermination is being found by even those to the minds of men who are interested in natural history. The world is the result of the natural persistence with which nature is every kind of human and it

and many. These, however, are assisted to a marked degree by

valuable animals and war to the slaughter the fish and birds

Notwithstanding this, Africa is still rich in animals, birds, and fishes, and by placing certain restrictions upon their destruction

would then be able to gun or fish with reasonable success without unduly depleting the future supply of game.

in 1849, was a fish of Africa, which generation, after it had  
been sold by the powers, is no longer in force for fifteen years. By

in Africa. Through their extensive commercial presence, they have cornered

to support the most extensive gifting program in the world.

One must ever watch the provisions. I use cranberries at 10¢ a lb., lyons at 1¢ that is plain of the bark 15¢ most extending from the twentyth percent of water latitude to the southern line is the best.

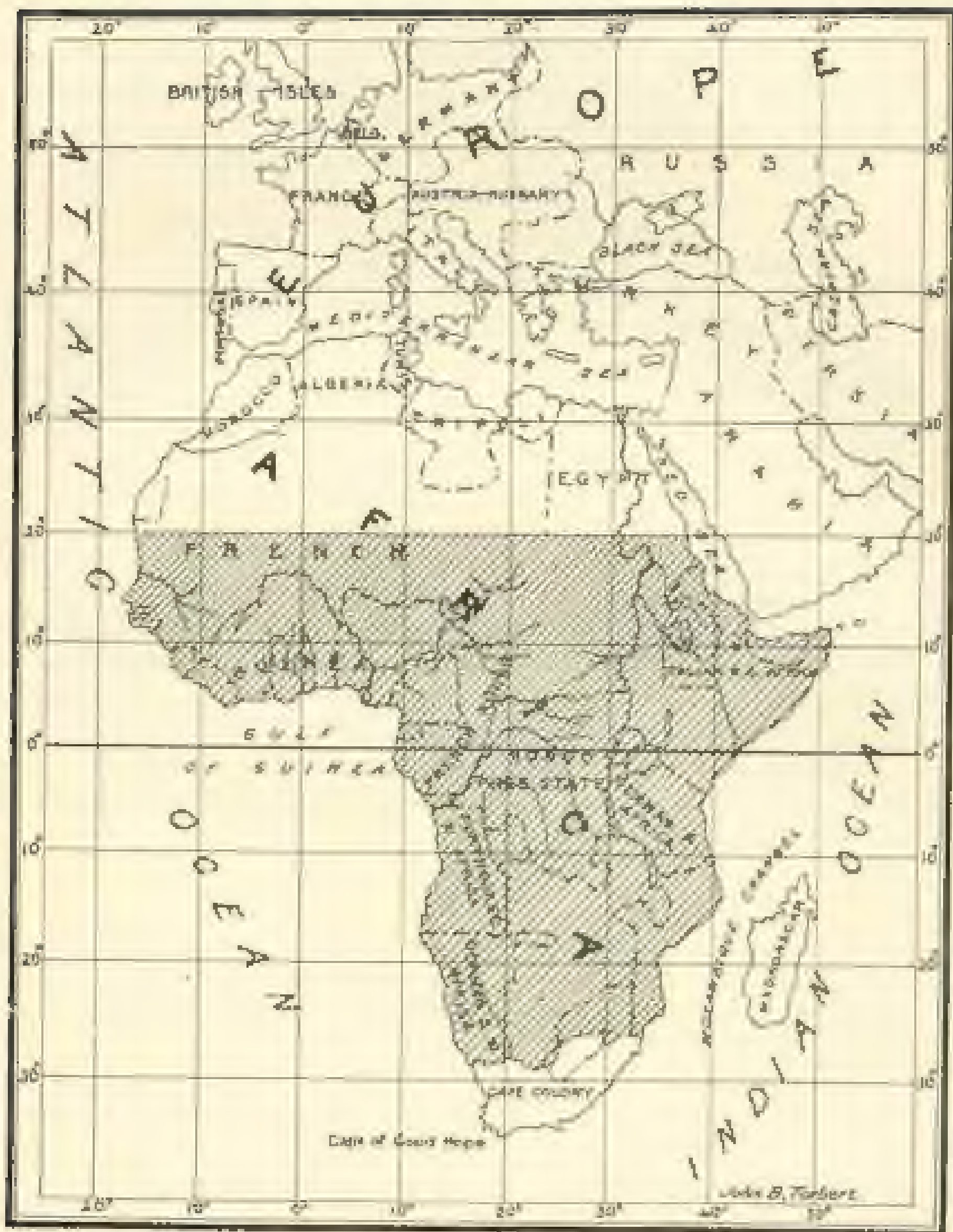
to the person chosen and the Herdman. Under the terms of the con-

The young of certain animals, including the elephant, the walrus, the hippopotamus, gibbon, and orang-utan, and cheetahs are protected in almost the same manner when accompanied by their young. Further, as compensations for the protection of young elephants, on all elephants' tracks, including those of a baby, are to be con-

ten went in to effect. The eggs of ten such nesting birds of a large number of other birds, are to be protected, and those of the ostrich and of porcupine snakes and pythons are to be destroyed. A hundred of lions, leopards, hyenas, others, lions and other animals

1941/1942 40157 414 614/142.

The method of mapping or keying entries is quite similar to that of extent



Map of Africa, showing territorial acquisitions since the Conference of Berlin, 1884-1885, placed according to the results of the Berlin Conference.

animals within the protective zone, and these are revocable where the provisions of the convention are in any way violated.

Another provision of the convention is that the contracting parties shall, as far as possible in their respective territories, encourage the domestication of zebras, elephants, and ostriches.

Joux B. TOURNET.

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## ANNOUNCEMENTS

The Board of Managers of the National Geographic Society begs to announce to the resident members that about 200 responses to circular letter of October 18, 1900, have been received. A very large majority of the replies favor a reduction of the number of lectures by dropping either or both the Lenten and Technical courses.

With this positive expression of preference on the part of the resident members, and in view of the probable increase in cost of the Technical course, due to the fact that a more expensive hall than that of Columbian University would have to be secured, the Board has decided to discontinue the Technical course during November and December and to omit the Lenten course of the present season. The Popular course at the Congregational Church will be given as heretofore on alternate Fridays, beginning Friday, November 9, 1900.

Membership tickets admitting two persons to the lectures and a preliminary notice of the lectures during November and December will be mailed in a few days.

### POPULAR LECTURES DURING NOVEMBER

The course of Popular lectures will be opened Friday, November 9, 1900, by Mr M. H. Saville, of the American Museum of Natural History, New York, the subject being "The Ancient City of Mitla, Mexico." The lecture will be illustrated by lantern slides.

The second lecture will be given by General A. W. Greely, Chief Signal Officer, U. S. A., on Friday evening, November 23, 1900. General Greely's subject will be "A Trip through Alaska."

The lectures will be given in the Congregational Church, corner of Tenth and G streets northwest, at 8 o'clock p. m. sharp.

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